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DEPARTMENT OF MILITARY ART, UNITED STATES ARTILLERY SCHOOL.

ESSAY.

Assuming the Present Defenseless Condition of
the Sea-Board of the United States, what
Military Policy and action should ob-
tain in the event of a Sudden De-
claration of War by a
Foreign Power.

—BY—

SOLON F. MASSEY,

1st Lieutenant 5th Artillery.



FORT MONROE, VIRGINIA :

PRINTED AT THE
UNITED STATES ARTILLERY SCHOOL
1886.



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CORRECTIONS.

- Page 1, line 16, read *drought* for droughth.
" 2, " 30, read *pierce* for peirce.
" 3, " 18, read 2177 for 1177.
" 4, " 35, read *pierce* for peirce.
" 5, " 4, insert comma after *roof*.
" 8, lines 36 and 38 read *maritime* for marintime.
" 14, line 7, read *Necessities* for Necescities.

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Would not such a course be analogous to our trusting our national safety against foreign war to :—

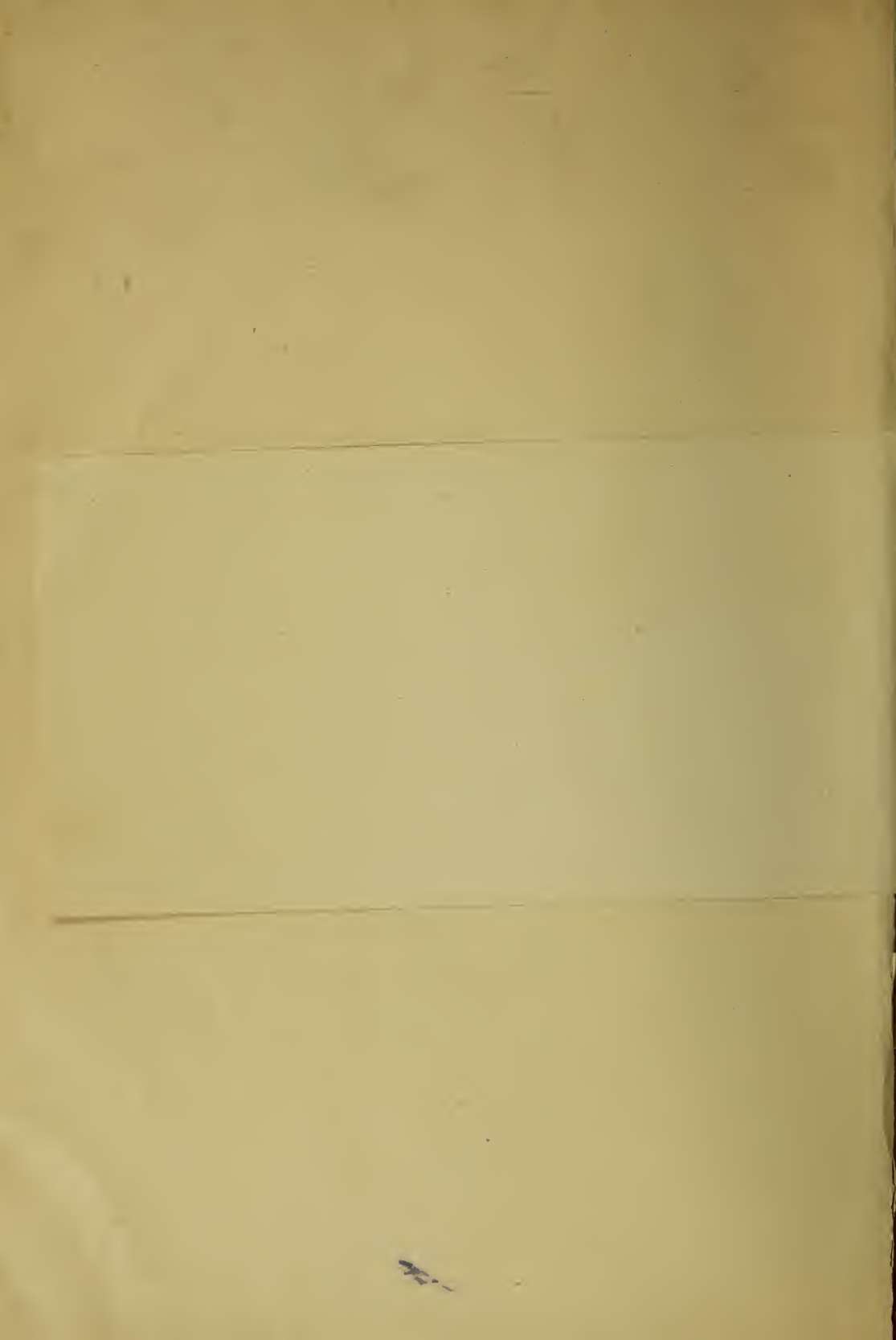
1st. Our isolation and the peace-loving character of our people and,

2nd. Our wealth of resources, material and personnel, and our ingenuity?

In deciding on "what military policy and action should obtain in the event of a sudden declaration of war by a foreign power" in our present condition, there is not much literature to draw upon.

What *should be done*, while there is still time to *prepare*, has received the attention of many writers, professional and lay, and the annual recommendations of the "Board of Engineers for Fortifications," approved by the Chief of Engineers, the same from year to year, constitute a small library ; and I might

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Assuming the Present Defenseless Condition of the Sea-Board of the United States, what Military Policy and Action should obtain in the Event of a Sudden Declaration of War by a Foreign Power.

The policy of the United States on the question of the national defense has for many years been remarkable.

Suppose the great city of New York were to have neglected to build a single steam fire engine, but to have intrusted the safety of its many millions of property from fire, to a few very old hard engines, manned by a small though well trained squad of paid firemen, justifying its economical course by the argument that : —

1st. The people are so careful and intelligent that fire is not likely to occur, and would be extinguished in its incipency if it were to break out anywhere.

2nd. If, however, a conflagration should be produced by a long state of droughth assisted by a high wind, the Mayor would have no trouble in ordering any number of steam fire engines built, as good as any city has and could get any number of volunteer firemen to man them.

Would not such a course be analogous to our trusting our national safety against foreign war to : —

1st. Our isolation and the peace-loving character of our people and,

2nd. Our wealth of resources, material and personnel, and our ingenuity?

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cite them as authority for saying that nothing could save us, were any powerful maritime nation to attack us.

In discussing this subject it will be well to ascertain in what way and to what extent "our sea board" is "defenseless." On this subject the Board of Engineers says : —

"In the event of war with a maritime nation, if we had no well digested system of fortifications ready for use, the cruisers and war vessels of the enemy could run into our harbor, and, without landing, could either destroy the property along our shores or else lay our cities under contribution."

As to our isolation, it might be expressed mathematically by the *square root of a negative quantity*.

"There are foreign military and naval depots and arsenals in close proximity and the arrival of armed vessels will follow in a few days or hours the declaration of war."

"Thirty six hours' steaming could bring them from Halifax ; six hours could bring them from Havanna ; and ninety-six hours from Victoria; Vancouver's Island, could bring them in front of San Francisco, the navy yard at Mare Island, and the arsenal at Benicia."

"There might be very little time for preparation, to meet the assaults of these fast running, seagoing, armored ships, ships clad with six to twenty-four inches of iron armor, carrying rifled guns from 9 inches to 17 inches bore. With even a single vessel of the kind in one of our harbors it would be of no avail to collect troops in the city or town threatened."

"Suppose, with our railroad facilities, we could concentrate 100,000 men in 24 hours at the point threatened, of what use would they be against the armored ship?" They might, in a night, throw up temporary earthworks, and hastily mount, on improvised platforms, a few light guns, such as 32 and 42 pounders and even 100-pdr. rifles, by almost superhuman efforts; but if their projectiles disturbed the rest of any one on the armored ship, she would simply move beyond their range, and, with her 800 to 2000 pounders, pierce the earthworks through and through, dismount the guns, and explode the magazines on shore.

The neglect of suitable preparation cost France many millions of treasure, a portion of her territory, and a great humiliation and "the disasters of the first three months of a war under the present condition of our defenses might cost the nation tenfold the expenditure that would be needed to thoroughly protect our sea coast against attack."

A powerful enemy may wage war against us : —

"1st. By attacking our commerce and navigation upon the ocean. As,

however, no military preparation on the shore can avert this danger and the means of meeting it are purely naval, these means do not now fall under consideration."

"2nd. By assailing one or more of the important points of the coast with a large military and naval force, with a view to immediate damage, or more or less protracted occupation."

"3rd. By suddenly appearing with a large squadron of vessels before our principal commercial cities, laying them under contribution, and burning, or carrying off the shipping, and by making powerful attacks upon our navy yards in order to destroy those establishments."

"4th. By attacks on smaller towns and establishments of the coast with small squadrons or single vessels, or with privateers, capturing or destroying the shipping therein, and levying contributions, and by like means intercepting the interior commerce within the bays, sounds, and estuaries of the coast; these lesser enterprises being often conducted under the countenance and support of considerable fleets."

Our means of defense are :—

1st. 1177 officers and 25,000 men, Regular Army,

2nd. 87,000 organized militia or state troops,

3rd. A small navy of excellent officers and men and very inferior ships.

"Old casemated works, designed long before the introduction of the 800 to 2000 pounder rifled guns into modern warfare; their walls pierced for guns long since out of date; without iron armor or shields, and but partially armed with the old ordnance; with old earthworks some of them built in the last century; with new ones for modern guns and mortars but partially built and rapidly being destroyed by the elements by reason of their incompleteness; with gun batteries without guns and mortar batteries without mortars; with no carriages whatever for barbette guns of large size except such as require the cannoneers to load from the tops of the parapets, from which they can be picked off in detail by the enemy's sharpshooters; with an excellent defensive torpedo system, but partially carried into effect; with but a very small number of our works prepared with the torpedo casemates and galleries necessary for securing the electrical apparatus from the enemies fire, and for conducting the electrical wires to the torpedo lines which must be laid when the day of trial comes, and with less than 200 engineer soldiers educated for torpedo and other engineer service," though 780 would be required for the 30 channels that would need to be defended thoroughly.

What the Board of Engineers propose as necessary for our defense is here pertinent :—

“Fortifications must command from the shores exterior to our harbors all the waters from which the enemy can reach our cities and navy-yards with his shot and shell; the harbor mouths and all the narrow passes within them, must also be occupied, and if nature has not afforded all the positions deemed requisite, others must, if practicable, be formed artificially. Fortifications should succeed each other along the channels of approach and in our harbors, so that the enemy may nowhere find shelter from our fire while lying within our harbors, should he succeed in passing the outer lines of works. The harbor mouths and channels must be obstructed by lines of electrical torpedoes for holding the enemy's vessels under fire of the fortifications, previously constructed and stored in the latter, and laid, on the advent of war in systems, the plans of which have been carefully elaborated in time of peace, by studies of the local charts and tidal currents, each harbor having its own system recorded in this department. The wires, for conducting the current from the electric apparatus on shore, must at the same time be laid securely in subterranean galleries carried out to deep water, and the electric machines themselves—the hearts of the torpedo system—must be placed in chambers within the fortifications, hidden from the enemy, and secured beyond all peradventure from his direct and curved fire. The galleries and chambers must be covered with heavy masonry arches and great masses of earth, and the former, to be efficient, must be indurated, and the latter compacted by time. The torpedo lines must be served by officers selected from the Engineers and the Artillery, assisted by detachments from the Torpedo Corps of of intelligent and skilled engineer soldier, and both officers and men must be thoroughly instructed in the theory and practice of electricity and torpedo obstructions; for they must know how to render the torpedoes instantly harmless for our own vessels, or active against an enemy's.”

“Heavy mortars must be placed in large numbers to command all those positions where an enemy is likely to anchor within their range, either for the purpose of tampering with, or destroying our torpedo lines, or shelling our cities and public depots of military and naval supplies. The efficiency of mortar batteries against shipping is acknowledged by all military engineers; it is fully appreciated by the navies of all nations, and they are comparatively inexpensive.”

“Our guns and mortars must be capable of peircing the sides of his iron clads and of breaking in his decks, and they must be mounted in numbers sufficient to make it impossible for any of his fast running war steamers to get past our works.” (See Note 1, appendix).

It would no doubt be very annoying to build turrets, barbette, and mortar batteries, &c. after war is declared, and the enemy at hand.

Our situation is very like that of an easy-going man who was taken to task for not mending his leaky roof by a friend who had taken shelter in his house during a rain storm. "You wouldn't have me get out there in the rain and repair it, would you?" he replied. "When it doesn't rain the roof doesn't leak."

In peace we need no fortifications, and in war it might be too dangerous to build them.

As a fair sample of the twaddle that has contributed to our present want of preparation, a leading Chicago newspaper² recently said :—

"The fellows that sneer at 'our little army' and our 'old hulk of a Navy' forget that there are 50,000,000 of people behind them. Uncle Sam can move that old flag from the top of the national capitol, or from some peak on the Rocky Mountains, and sound a bugle call, and ships would fall in line, and 1,500,000 men would answer 'Ready'."

The chairman of the house sub-committee on fortifications is reported³ to have said only January 25th 1886, that he did not think "a large appropriations for fortifications necessary."

"The country was in no danger; the moral force of fifty million people was a strong defense. It was not fortifications we needed now; it was guns. There was no use for a fort without ordnance. We could prevent any hostile vessel or fleet from entering any of our rivers; we had guns that could sink a vessel at a thousand yards. No fleet could get up the Potomac to take Washington. The only thing, he said, was that they might stand outside the harbor and shell New York, or Boston, or Philadelphia, but the danger of this he thought was greatly exaggerated, ('shelling dont amount to anything'." He thinks the shelling of Vera Cruz showed *that*, and that the Mexicans got frightened, but Americans would never have given up the city.

I cannot do better here than give an account of the latest naval attack upon works such as ours.

On July 11th. 1882, the british fleet bombarded Alexandria, Egypt.

This port is defended by a large number of forts, redoubts, and of towers commanding the passes, the entrance of the passes and even the open sea; but the greater part of these works being poorly armed were incapable of serious opposition to the English ships.

An article in the "Revue d' Artillerie"⁴ says, that" besides a few 10 inch 18 ton, and 9 inch 12 ton Armstrong guns, the only guns capable of piercing the armor of the English ships, and a few rifled guns of lower calibre, the

greater part of the guns were cast iron smooth bores, the projectiles of which had neither range nor accuracy, and still less power of penetration."

Fort Marabout, one of the most important, was armed with four heavy guns, two 10" 18 ton and two 9" 12 ton; thirty 32 pounder smooth bores and five mortars. Fort Mex, an earthwork, had 31 pieces, 4 of heavy calibre.

In these, and the works ranging along the old harbor, were mounted 56 guns of various calibres.

On the other side of the old harbor was Fort Phare, built of masonry and armed with one 10" 18 ton, four 9" 12 ton, and about twenty 64 pounder smooth bores. There were also numerous batteries along the shore, abutting against the Ras-el-tin palace, designed for 17 guns of large calibre.

Then there was the 8 inch Armstrong gun on a Moncrieff carriage at the old hospital, and Fort Ada (masonry) of at least one 10" 18 ton Armstrong.

Fort Napoleon, sweeping a considerable portion of the inner harbor, had one 10" 18 ton gun.

The Garrison was placed at from 7000 to 8000 men, only 700 of whom were artillery men.

Here we see a state of affairs very similar to our own, namely, masonry forts and earthworks, poorly armed and garrisoned, so close to the city that it might have been shelled by the fleet at such range as to subject the ships to little danger from the shore batteries.

But the works had five 10" 18 ton, six 9" 12 ton and one 8" guns, all superior to any we have at our most important harbor.

The English fleet consisted of 8 iron clads and five gun boats; the armament was 4—16" 80 ton, 4—12" 25 ton, 6—11" 25 ton, 38—10" 18 ton, 22—9" 12 ton, 12—8" 9 ton and 2—6½" 7 ton,—a total of 86 rifled guns of eight inch calibre or greater.

A few 10" 18 ton Armstrong guns only, out of the entire armament of the Egyptians, had sufficient power to penetrate the armor of the English ships with the exception, however, of that of the *Infleible*.

The bombardment lasted eight hours from the ships. The Forts, firing but a few hours, were in turn silenced by the concentration of the fire from several ships or gun boats.

Though difficult to give a correct account of the effects produced by the English projectiles upon the defensive works, they were all roughly handled; and the batteries at Fort Mex, and the works at Ras-el-tin were reduced to a condition of the utmost confusion, many guns being dismounted and one turned completely over.

The gun on the Moncrieff carriage, though worked long within sight of the ships, remained uninjured.

Several ships were hit, but the *Suberb* only had her armor pierced, which happened twice. The gun boats were not hurt, thanks to their small size.

It is sure that as large a number of vessels as the above would be sent against us, were we to have war with England, and they might combine in assaulting some one of our harbors, or act singly, or in smaller groups, at several.

To show what dismay and confusion would probably arise at the War Department in case of sudden foreign war, I will detail a few measures that were adopted in March 1862, when the civil war had been going on over a year, and we had 600,000 men in active service⁵.

On March 9th. 1862, the Secretary of War sent the following dispatch to the governors of New York, Massachusetts, and Maine. "The opinion of the naval commanders here is, that the Merrimac will not venture to sea, but they advise that immediate preparation be made to guard against the dangers to our ports by large timber rafts, protected by batteries. They regard timber rafts, guarded by batteries, as the best protection for temporary purposes.

General Totten says do not neglect the batteries."

This sounds like the old French cry of *saue qui peut*.

Th same day General McClellan telegraphed the commanding officers of Fort Delaware ; Fort Mifflin ; New York Harbor, New York ; Newport R. I. ; Fort Trumbull, New London ; Boston Harbor ; and Portland Maine : —

"The Rebel iron-clad Merrimac has destroyed two of our frigates near Fort Monroe and finally retired to Craney Island. She may succeed in passing the batteries and go to sea. It is necessary that you at once place your post in the best possible condition for defense, and do your best to stop her should she endeavor to run by. Anything that can be effected in the way of temporary batteries should be done at once."

The same date the Assistant Secretary of War sent the following : —

"WAR DEPARTMENT, MARCH 9TH, 1862.

HENRY B. RENWICK, ESQ.,

21 Fifth Avenue, corner 9th. Street, New York.

The Merrimac, an armor-clad vessel belonging to the rebels, issued from Norfolk yesterday, and captured several of the United States blockading vessels, and threatens to sweep our whole flotilla from Chesapeake Bay. Under these circumstances it is of the last importance to capture or destroy the Merrimac, and the whole wealth and power of the United States will be at

command for that purpose. As this movement was anticipated and the subject of discussion between you and myself last December, you have no doubt thought of various modes by which it could be met and overcome most promptly. The Secretary of War desires you quietly to call a meeting of from three to nine persons, at your discretion, of the best judgement in naval engineering and warfare, to meet immediately at your father's house or some other convenient place, and to sit as a committee to devise the best plan of accomplishing the capture or destruction of the Merrimac. I would suggest the name of Abraham S. Hewitt as a member of the committee. You will bear in mind that every hour's delay to destroy the Merrimac may result in incalculable damage to the United States and that the plan or plans for her destruction should be submitted at the earliest hour practicable for the approval of this Department, to the end that their execution may not be unnecessarily delayed a moment.

To enable you to communicate hourly with this Department the telegraphic company is directed to transmit all messages from you at the expense of the Government.

Acknowledge this dispatch the moment you receive it. Spare no pains or expense to get the committee together immediately. Act with the utmost energy. You and each member of the committee will consider this whole matter confidential."

The following also was sent :—

"WAR DEPARTMENT, MARCH 15TH, 1862.

C. VANDERBILT, Esq., NEW YORK.,

The Secretary of War directs me to ask you for what sum you will contract to destroy the Merrimac, or prevent her from coming out from Norfolk, you to sink, or destroy, her if she gets out. Answer by telegraph, as there is no time to be lost."

(Signed by Assistant Secretary of War).

What was this Merrimac? Not much more than a unwieldy wooden hull, with a pitched roof made of railroad iron; and it is now known that had the strength of the Monitors guns been known then, the first fair hit would have placed the Merrimac *hors de combat*.

In the light of these records, and assuming the *Inflexible* as the intruder instead of the Merrimac would it surprise us much, in a like emergency, to find even the present administration calling upon Mr. John Roach, to know how much he would take to destroy the disturber of our maritime quiet?

The writer of the Prize Essay for the year 1884, says in his conclusions:—

"The U. S. cannot defend its great maritime cities from the attacks of any naval power."

Another writer⁶ gives the following as what might be expected if war were suddenly declared by a great military power whose fleets, and transports, were on their way from Halifax or Bermuda, with no intimation of where they would assail us.

“1st. A call of state troops of say 250,000 men, each state to furnish a certain quota. Officers of the Regular Army would of course, scatter wherever they could obtain higher commissions.

2nd. The purchase of enormous quantities of arms, powder, tents, provisions, animals and other military stores, and the chartering of steamboats and railways.

3rd. The distribution of these troops and supplies, at prominent points along our *nine thousand miles* of coast and frontier, and the concentration of the Regular Army, at points where it could be used to the best advantage.

4th. The mustering of troops, and organizing them into brigades, divisions, and corps.

5th. The inspection of fortifications, and hastily putting them into the best practicable shape for defense.

6th. The building of supplementary field works, intrenched camps, and the planting of torpedoes, and channel obstructions.

7th. The attempt would also be made to buy or make heavy guns to complete the armament of our forts; but it is needless to say that very little could be done in the time available for that purpose.”

What Military Policy Should Obtain ?—Some of the highest authorities have written copiously to prove that we are *defenseless*, as I have attempted to show, and it is at least consistent that they should all refrain from suggesting any policy or action as likely to avail in the event of a sudden declaration of war by a foreign power, even if there be no other reason for their reticence.

Officers of experience and intelligence, to whom I have broached the subject in search of ideas, have uniformly replied in substance that “we would do the best we could,” though one suggested following the example of the Russians in 1814 and burning the city, if we found it bombarded, and retiring to the interior.

In face of the ominous silence of military writers on the question at issue, and what has preceeded, I should be justly chargeable with emulating the fool who “rushes in where angels fear to tread,” were I not able to plead orders in venturing suggestions as to “what we must do to be saved.”

I have assumed three weeks as the maximum time for hasty preparation,

at the end of which we should be attacked in force along the whole line.

As to the second way of our being attacked, (the first being a purely naval question) *i. e.* the enemy assailing one or more of the important points of the coast with a large military and naval force, with a view to more or less protracted occupation,—

The coast should be divided up into districts of defense. The Regular Army should be recruited to the maximum strength of which its organization admits,—about 53,000. The state troops, responding to the call of the President, should be associated with the Regular Army, so that, in any division of the whole force into separate armies, a like proportion of each would be found.

It is quite certain that a force could be speedily organized large enough to furnish, in this way, a main body with which to defend each of these districts from invasion, which would not probably be attempted, since the object of the hostile expedition would be more easily accomplished by attacking cities, navy yards, &c., than by landing, and thus allowing our immense population to take part directly in the national defense.

The main body would take station at such a point in each district as to admit of ready transportation to the point where needed in case of attempted landing. In case of an extended district, the main body might be divided into sections to constitute the reserves for the garrisons of the individual district.

The force in each district would garrison the coast batteries organize a special reserve, and also a guard and observation service for the whole districts. This latter service would be performed by a chain of posts, and outposts.

Strong detachments with field guns should be placed at points peculiarly favorable to landing.

On high points along the coast observation towers should be constructed, the observers being men familiar with naval manœuvres. As in the "Virginus" scare, heavy timber platforms should be constructed, where permanent ones are wanting, in barbette batteries otherwise suitable and equipped.

In the forts, all guns having carriages should be mounted as rapidly as work day and night could accomplish. Civilian labor should be, in the main, employed for this work. The 8" rifle (converted) of which we have about 140, should be distributed among the forts commanding important channels. The 13" and 10" sea coast mortars, are probably our most valuable weapons, and should be mounted with the least possible delay in batteries as much together as possible, concealed from view of the fleet behind substantial earth-works.

In the open batteries there should be machine guns, and light guns for firing grape, canister, or simply shell. A heavy shower of these smaller missiles would rattle through the tops, remove dead spaces on the decks, enter ports, and be very valuable, were the garrison able to stay to use them.

In the meantime the regular foot batteries and any heavy artillery state troops should be assigned to the sea coast defenses and commence at once drilling at all the guns mounted ; and the old regular soldiers, forming but a small leaven to a large uninstructed mass, should not be taken from these drills, and other soldier's, duty to do work for which civilian labor would suffice.

One the first questions to come up, would be how to provide for the thousands of troops suddenly thrown from all directions, into the large cities,—New York for instance—without tents, rations or facilities for cooking. For this we might use the vast system of hotels along the beach from Rockaway to Long Branch which are connected by railroads. The troops could be sent direct to these improvised barracks, avoiding the confusion of landing them in the city, and there quartered, fed, organized, drilled, supplied with ammunition, camp equipage, &c., and instructed in throwing up batteries and temporary shelter.

We should have to make extensive use of obstructions and sub-marine mines to provide against the 3rd. and 4th. methods of attack, or for the defense of the seaboard generally.

Obstructions, Fixed and Floating.—The former would be used for channels which admit of being closed to all navigation during hostilities, and of not too great tides and depth. They are rows of piles of various arrangements ; *chevaux de frise* of wood or iron against smaller vessels ; ships loaded with stone ready to be sunk where required, &c.

In deeper channels, strong currents &c., but affording good anchorage, the fixed obstructions would be used. The kinds are numerous :—chains, or iron ropes supported by bouys, rafts, ships or floating timber bound in bundles by chains ; so-called *cable-nets* and *horizontal-nets* and *linked-rafts*.

The construction of these is technical but, with our skilled labor, ever ready and abundant, these obstructions could be made inside the time specified.

Submarine Mines.—There are three kinds : —

Mechanical Contact,

Electrical Observation,

Electrical Contact.

Their mode of operation is apparent.

We should have to rely mainly on the first, in any emergency, though dangerous to friend and foe. There are many varieties. They are easily and cheaply made, and may be improvised at the last moment, so says Captain Maguire of the Engineer Corps.⁷

If that be so, they should be ordered in large quantities when war becomes inevitable and laid in all important channels, not provided with better. Sufficiently skilled labor for laying them could be had without delay.

Dummies, or dumb mines, would be planted in large numbers with the active mines, but should, in no case, be depended on alone, as some enterprising newspaper reporter would surely inform the enemy of that fact.

As to the other two classes they are complicated and require much time for producing the many component parts, including the galleries, electrical rooms &c., and technical training to lay them.

The Engineers propose to have these mines operated by engineer and artillery officers, and a few of these officers are instructed in the subject each year at Willet's Point. The Artillery School, applying for the means of teaching the artillery officers of the school, some of the rudiments of this art has, I understand, been offered a *photograph* of a torpedo, lest some of the secrets of the system might be divulged if more were communicated.

Not having seen this picture, I was obliged to apply to an officer of engineers⁸, who has ventured to furnish me the following notes, which are his own personal ideas. He says :

"Torpedoes have been provided for the defense of Boston, New York, and Philadelphia, and a partial supply for San Francisco. There is but one factory in the country that has the plant for making torpedoes, and its capacity with the present plant is about 1000 a year. Other factories would of course take up their construction in case of war, but some time would be needed for the preparation of the plant, and the time it would take to provide torpedoes sufficient for the defense of our principal cities can therefore not be estimated. In any event, it would be a question of months and not weeks. But of all the essential parts of the torpedo system, the torpedo case is perhaps the least difficult to provide. The operating apparatus in the casemates, the automatic arrangement in the torpedo case, and the manufacture of the cable, all require skill and experience in their construction, and any delay in laying down a system would most likely be attributable to one of these sources."

"Our present supply of cable was obtained from England and is stored in the casemates of the Willet's Point Fort. Our own manufacturers have had but limited experience in the construction of such cable as we need, and if we did not have time to import a full supply before the declaration of war, we would

no doubt, experience considerable delay in this question. We have never laid down a ground group, with a view of getting some idea how long it would take to plant a system of mines, but I should say in a general way, after conversing with some of our officers about it, that it would take two weeks to plant the New York Harbor system, supposing all the materials to be on hand, and everything to work smoothly. I know of but two galleries, one at Fort Schuyler, and one at Fort Wadsworth. The one at Schuyler is completed, but I am not sure about the one at Wadsworth."

"The present strength of the battalion of engineers is 400 men. One officer charged with the planting of a system of torpedoes, would have a detachment of non-commissioned officers and privates sent him from Willet's Point, but, as this force would probably be insufficient, he would form a class of trained intelligent mechanics, who, after about a week's instruction, ought to be able to do all the mechanical work of putting together the various parts of the torpedoes. In brief, the electrical torpedo system, in view of the totally inadequate supply of the parts, and the difficulty and delay of obtaining some of them, and the absence of operating casemates and galleries leading to the water, would not be a large factor during the first few months of the war, unless Congress should take timely warning and authorize the purchase of all needed supplies before the declaration of war."

The torpedoes, already provided for any harbors, would be laid at the earliest moment, and we should, of course, commence at once the manufacture of electric torpedoes in large numbers, and, at forts where they are to be used, the construction of the rooms for electrical apparatus, and the galleries. The electric light should be promptly put up, illuminating any desired portions of the harbor, especially the mines and obstructions.

Too much stress cannot be laid on the fact that mines are of no use unless protected by guns, and this would determine their distance from the batteries.

Those officers of engineers and artillery, a small number at best, that have been trained at Willet's Point should, in each case, be detailed for duty with mines, allowing no delay or exceptions.

Finally, in case of war with England, it would be absolutely necessary for the protection of Buffalo, Erie, Cleveland, and Detroit, that the Canadian peninsula north of Lake Erie, be occupied at the very outset of the campaign. to control the Welland Canal and prevent the enemy from bringing White-worth or Frazier guns, within range of those cities. Also against Mexico we should want to take the offensive at once.

S. F. MASSEY.

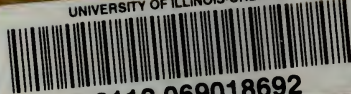
1st Lieutenant 5th Artillery.

APPENDIX.

1. All foregoing quotations are from Report of Chief of Engineers for 1881.
2. "Inter Ocean."
3. "Washington Star," January 25th, 1886.
4. Translation in Ordnance Note No. 223, 1882.
5. Record of Rebellion, Series I, Vol. IX.
6. Major King's article on "Military Necescities of the U. S." &c. M. S. I. Journal, Dec. 1883.
7. Many of the foregoing recommendations were obtained from Magnire's "Attack and Defence of Coast Fortifications."
8. Lieut. S. W. Roessler, U. S. Eng., Adj't Batt. Eng., Willet's Point, N. Y.



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